

Managing livestock by-products in Iran

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In the rural areas of Iran, farmers and nomadic pastoralists have a long and rich history of animal husbandry and range management that stretches back some nine thousand years. Iranian tradition and experience shows that if such by-products as manure, bone, horn, hoof, blood and fat are well managed and carefully processed they provide benefits to farmers and protect the productivity of their natural resources. Indigenous stockbreeders in Iran are practised in using all possible livestock products and by-products to improve their crops, minimize waste and reduce the amount of external inputs they require.

Currently, the by-products most frequently used by Iranian farmers are bone, manure and horn. Farmers recognize that bone has an important role to play in improving the fertility of the soil and they still bury animal bones to increase soil fertility. In some parts of Iran, farmers burn animal bones in their orchards when fig trees start fruiting. During this fumigation process the weaker fruit fall from the trees leaving the rest to develop strongly. Similar practices are employed by cucumber farmers at blossom time and when the fruit begins to form. Animal bones have also traditionally been used for cultural purposes and have provided the basic material for making many domestic, musical and personal objects.

In Iran manure is an especially valued and carefully treated commodity. Rural and urban communities use it to fertilize the soil, produce energy (burning), eradicate pests and plant diseases, make bricks and plaster walls. In some cases it is also used to treat human illness. Villagers, especially those who are involved in both arable and livestock farming are skilled at categorizing, dehydrating, distributing and using animal manure. Different types of animal manure are known to have specific properties and research has revealed that farmers have rich experience and knowledge about the value and uses of the types of manure produced by different species of domesticated animals and birds. Farmers are also well aware of the way in which the quality and quantity of food a creature receives critically affects the quality of its manure, and that the age of manure is an important factor closely related to the rate of decomposition. The use of fresh manure, for example, can damage trees and roots and weed seeds in the manure may survive and cause damage to the crop.

Local people are usually obsessive about the rate, time and way animal manure is spread on farmlands and orchards. Farmers are particularly careful about the amount of manure used because they believe that too high quantities of manure attract chafer grubs and other insects. They know how to use the different strengths of the various types of manure to good effect. Poultry and bird manure, for example, is particularly strong. One ton of pigeon manure contains 35 kg of nitrogen, a value that is several times greater than cow manure.

In some cases manure can be an effective pesticide. Some farmers, for example, mix threshed bitter gourd or *colocynth* (*Citrullus colocynthis*), vine wood ash and cow dung and use this for killing aphids and mites. Others soak their seeds in cow urine to protect them against soil pests.

Farmers collect manure in different ways. During fallow periods they often make livestock feeding lots on their arable land to

ensure it is well fertilized by animal droppings. In some places arable farmers encourage pastoralists to graze their sheep and goats on their land, and in others they tether their animals in areas where they think manuring is necessary.

Manure also has a variety of other uses. For centuries farmers have made a practice of burning animal manure to protect their fruit trees from cold. Manure is also credited with medicinal properties. For example, the dung of newly born foals mixed with the milk of lactating donkeys is used in some villages to treat whooping cough.

Iranian villagers also utilize animal manure and bird droppings as a source of energy. In some rural areas animal manure is still used to generate heat and women believe that the best fire for baking bread is one made from animal droppings because it produces more uniformly baked and thoroughly toasted bread. Researchers have suggested that animal manure is a particularly clean form of fuel because it produces bio-gases that burn easily yet pollute the air much less than fossil fuels such as coal.

Horns and the clippings from animal hooves have been used for centuries to fertilize the soil, and smoke created by burning a mixture of horn and cow dung is regarded as an effective way of controlling pests such as locusts. The capacity of blood to increase soil fertility has also been long recognized and this knowledge is put to use by villagers who often slaughter their animals under fruit trees and bury blood and other animal parts in the soil to increase its fertility.

History and research into current farming practices in Iran shows that Iranian stockbreeders have a high level of productivity and employ many complicated processes in exploiting animal by-products. With worldwide post-harvest losses running at around 30%, Iran's experience in creatively using and processing livestock products and by-products is particularly important. It provides excellent examples of cost effective ways in which farm incomes and the quality of the harvest can be improved and enhanced.

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